



Alternative Path Method: SB 2030 Energy Standard Cost-Effectiveness Application Requirements

Prepared by

**Center for Sustainable Building Research, University of Minnesota
Center for Energy and Environment**

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Cost-Effectiveness for Minnesota Sustainable Building 2030:

The significant improvements in building performance that are called for by the Sustainable Buildings 2030 (SB 2030) Energy Standards must be achieved in a cost-effective manner. A review of more than 100 recent projects across a wide variety of building types has shown that the Energy Standard level called for by the SB 2030 program can be achieved cost-effectively for the overwhelming majority of building types and situations. However, the analysis did recognize that there are exceptional situations where there may not be cost-effective options for achieving the low energy use goals for a particular building type. Therefore, an Alternative Path Method may be granted by the SB 2030 coordinator for a project that is able to document that significant energy saving design options were investigated in an effort to achieve the SB 2030 Energy Standard, but that the design options were not able to cost-effectively achieve the energy savings called for by the SB 2030 Energy Standard. This document outlines the cost-effectiveness criteria as well as the calculations and documentation necessary to achieve the Cost-Effective Requirements.

Projects that have demonstrated during the Design Development phase that they cannot meet the initial SB 2030 Energy Target cost-effectively (using strategies with less than 15-year payback) have the option of applying for the Alternative Path Method. This Method uses the estimated EUI achieved by incorporating all applicable strategies with a simple payback of less than 15 years (along with all other final design elements) which, if approved, becomes the SB 2030 Alternative Path Method Energy Standard.

Cost-Effectiveness Criteria. The legislation authorizing the establishment of the SB 2030 Energy Standards calls for cost-effectiveness to be evaluated according to practices used for the evaluation of utility energy conservation (CIP) programs. For the convenience of project development teams, program staff has evaluated the financial impacts of a range of variables to see how CIP program cost-effectiveness criteria translate into building industry standard measures of cost-effectiveness. This analysis has found that nearly all projects with a simple payback period of 15 years or less are cost-effective to both the building owner and society at large. Therefore, the Alternative Path Method for lack of cost-effectiveness will only be considered for projects that can document that reasonable alternative energy saving design alternatives were considered in an attempt to achieve the SB 2030 Energy Standard, but were found to have a simple payback (before any utility rebates) of longer than 15 years.

Any such projects that cannot fully achieve the SB 2030 Energy Standards cost-effectively are required to incorporate all reasonable and applicable energy saving upgrades that have a simple payback of 15 years or less (except upgrades that have an expected life that is shorter than the payback) or to achieve an EUI equivalent to a building incorporating these energy savings upgrades. Besides review of savings calculations, projects requesting this Alternative Path Method will be subject to a

general review of the list of design options evaluated and may be required to consider additional design options that have less than a 15 year payback. Project teams that may wish to request the Alternative Path Method should discuss this with the SB 2030 coordinator at the Design Development phase. The simple payback shall be calculated as outlined in the following section, and documented as outlined in the Alternative Path Method Documentation section of this document.

A project may be considered compliant with the SB 2030 program if they have achieved a EUI in design and operation *no greater* than an EUI that can be achieved by pursuing all energy efficiency strategies with less than or equal to a 15-year simple payback. The EUI created from all strategies with less than 15-year paybacks becomes the SB2030 Adjusted Energy Standard. Projects utilizing the SB 2030 Adjusted Energy Standard will be labeled as such in the public SB 2030 project database, along with energy consumption and other project information.

Simple Payback Calculation. Simple payback is a calculation that gives an estimate of how many years it will take for the energy cost savings to pay back the initial cost of an energy saving improvement. It is calculated by dividing the initial cost (or added cost of a design alternative in the case of a new construction project) by the first year's energy cost savings (without consideration of potential utility rate changes or the cost of capital). The table below outlines the basis of the simple payback calculation inputs that are to be used for the purposes of Alternative Path Method. The scope of costs considered in the Simple Payback Calculations shall not include redesign fees, demolition, or other costs of late-stage project changes.

Incremental Cost	Difference in project cost between a proposed energy savings design alternative and a baseline design that meets the minimum current energy code requirements.*
Energy & Demand Savings	Energy and demand savings calculations shall be based on the difference of building energy simulation results for a proposed energy saving design alternative and for a baseline design that meets the minimum current energy code requirements.* Building energy simulations used to determine these savings shall follow the requirements outlined in the SB 2030 Program Compliance and Reporting Requirements document found at www.b3mn.org/2030energystandard/download/SB2030Process.pdf
Electric Utility Rates	Electric cost savings shall be based on applying the local electric utility's applicable rate within the building energy simulation models.
Natural Gas Cost Savings	Natural gas cost savings shall be based on applying a widely recognized natural gas retail rate as outlined below within the building energy simulation models outlined above. Note which option below is used along with the rate and documented source. --Option 1: Retail rate as calculated for use in current CIP program filings [average of \$0.674 per therm for 2013-2015] OR . --Option 2: A retail rate projected by a natural gas utility and used within that utility's CIP program technical analysis services or rebate application review (e.g. for Xcel Energy in 2013--\$0.814 per therm Nov-Mar; \$0.756 per therm Apr-Oct).

*Project teams may choose to compare design alternatives to an actual base design that is more efficient than the minimum current energy code requirements. For items not directly addressed by energy code requirements (e.g. elevators), energy saving design options shall be compared against an appropriate option that represents a commonly used minimum standard practice.

Notification of Request for Alternative Path Method

Project teams must notify the SB 2030 Review team of an anticipated Alternative Path Method request by the project's Design Development (DD) phase end date. This timeline is intended to ensure that the project team identifies and completes the additional documentation and analysis necessary to demonstrate the need for an Adjusted Standard. The establishment of this timeline is also created to avoid non-compliance designations for projects with potential energy savings with less-than-15-year payback strategies that were not available in later stage designs. This submission timeline requirement of this section will be in effect for all projects with a Schematic Development (SD) start date on or after November 1st, 2013.

Documentation of Need for Alternative Path Method. Requests for Alternative Path Method shall be accompanied by the following documentation, which may be made available for review by a combination of the online tracking tool, email, or file-sharing application.

- A summary letter indicating the project name, date and version of design documents used for simulation inputs, a brief narrative outlining the selection of design upgrade options for consideration (including those documented as not cost-effective) as an appropriate approach to energy cost savings for the building (and whenever they are not part of the upgraded design package, the reasons that energy recovery ventilation and/or daylighting were not included), and a brief summary of the attached documentation.
- Electronic or hard copies of simple payback calculations showing that a number of possible energy savings upgrades were considered but found to have a payback of longer than 15 years for this project. This shall also be accompanied by documentation of energy analysis and incremental cost-estimates that were used as inputs in the simple payback calculation.
- Although information from the Energy Design Assistance program (EDA) is a good start, it may not be sufficient documentation for the Alternative Path Method evaluation. Additional analysis and documentation may be required.
- Documentation of the building simulation shall generally be consistent with the CD phase requirements in the current SB 2030 *Building Performance Evaluation Guide* for the baseline case and each design option that was shown to not be cost-effective with the following considerations:
 - Additional documentation of utility rates shall also be provided in a way that demonstrates the use of the rates noted in previous section within the simulation software.
 - For individual design options, a narrative shall note all input changes (relative to the baseline) and simulation documentation may be limited to those items that were changed, impacted by the changes, and which show the end-use and fuel summary and/or utility cost results,
 - When the review occurs before the CD stage, all available precursors to the required CD stage design documents shall be substituted for the CD documents, and additional notes about expected product selection are welcome.
- The tracking tool documentation for E1C and E1D shall be completely updated for the current project phase, including the Building Strategy Checklist. Note that the tracking tool guideline (E1C) may not be able to be marked as complete as the entry will show up as non-compliant until the review team grants an Adjusted Standard. The SB 2030 Review Team should be notified upon completion of E1C and E1D in the Tracking Tool to begin the review process.
- Incremental cost estimates shall be documented by any combination of signed documents from one or more of the following parties:
 - appropriate contractor(s),
 - project architect,
 - project engineer, and/or
 - third-party estimator.

Establishment of Alternative Path Method Energy Standard. The expected EUI achieved by incorporating all applicable strategies with a simple payback of less than 15 years (along with all other final design elements) becomes the SB 2030 Alternative Path Method Energy Standard. If the project will be using all strategies with simple payback of less than 15 years, then the project team's CD stage simulation shall be used to establish the Alternative Path Method Energy Standard. If the project team is including other efficiency improvements (with a greater than 15 year simple payback) then documentation of two simulations are required at the CD phase submission:

- Documentation of the simulation of all strategies with a 15 year payback or less, with the resulting EUI, which becomes the Alternative Path Method Energy Standard
- Documentation of the simulation of the design of the project and resulting EUI, which is required to be no greater than the Alternative Path Method Energy Standard

The CD stage simulation and documentation to establish the Alternative Path Method Energy Standard shall be consistent with the CD phase requirements in the *Building Performance Evaluation Guide*, except that the simulation is used to set the Alternative Path Method Energy Standard rather than to demonstrate compliance with the SB 2030 Energy Standard. The SB 2030 Alternative Path Method Energy Standard will be listed in addition to the original SB 2030 Energy Standard in the online tracking tool and in subsequent documentation and reporting. The Alternative Path Method Energy Standard will be added to the tracking tool by an administrator when adequate documentation has been provided for review and the SB 2030 coordinator has approved the Alternative Path Method Energy Standard.

Formal requests for application to the Alternative Path Method, appropriate documentation, and questions shall be directed to:

Pat Smith
Center for Sustainable Building Research,
University of Minnesota
1425 University Avenue SE, Ste 140
Minneapolis, MN 55455
SB2030@b3mn.org
612.626.9709